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Untreated persistent middle ear effusion

by

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Abstract

Seventy-nine children have been followed with persistent middle ear effusion (MEE). They were scheduled for myringotomy and insertion of ventilating tubes (VT). Several factors delayed elective surgery for two-and-a-half years in a closed population. After that period, the children were again examined otomicroscopically and hearing tests were performed. MEE persisted in 69 per cent of the ears, but was absent in 31 per cent. Atelectasis appeared in 26 per cent of the ears; in only a very few cases did severe atelectasis develop. Complications following delay of myringotomy and introduction of VT are minor.

Introduction

Middle ear effusion (MEE) is a common disease in childhood. It may present with various degrees of hearing loss (Cohen and Sadé, 1971). Spontaneous recovery is seen in the majority of cases (Sadé, 1979; Tos, 1980). When the fluid persists longer than three months, the MEE is considered to be chronic and surgery is indicated (Smyth and Hall, 1983). Nowadays the ventilating or pressure equalization tube (VT) is the accepted treatment.

Long-term effects of transympanic intubation may apparently lead to an increase in the number of patients with chronic otitis media and permanent hearing loss (Gunderson *et al.*, 1984). Other investigators have also reported untoward results from VT, including perforation and cholesteatoma (Ben-Ami *et al.*, 1983; Brooks, 1980; Lildhold, 1983). The obvious question raised by these reports is: what is the natural history of MEE? Does the use of VT cause more problems than it solves? Fortuitously, for a specified period, conditions were present which delayed any elective surgery in a closed population. The Soroka Medical Center in Beer-Sheva is the only otologic service in southern Israel. Owing to three successive events—a long physicians' strike, a shortage of nurses and a closing of the surgical unit for unrelated technical reasons—only emergency surgery could be performed. Thus, children with persistent middle ear effusion (longer than three months) were scheduled for VT but the surgery was delayed for at least two-and-a-half years.

Material

One hundred and fifty-eight ears were followed with persistent middle ear effusion. The age range was from 2 to 12 years of age, with a mean of six years of age. The female-to-male ratio was 1:1. At the beginning of the period, the children were diagnosed as having persistent middle ear effusion present for more than three months (although by history the fluid was present for a longer period). A hearing test was performed.

After the two-and-a-half year delay, the children were again examined to determine

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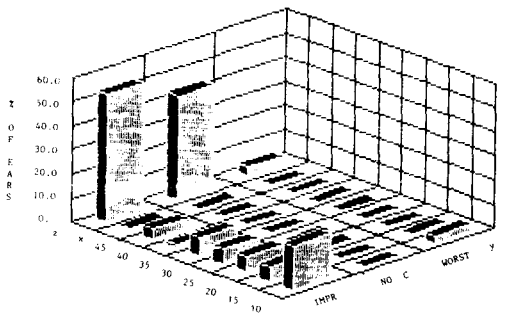


FIG. 1

Distribution of stages of atelectasis after waiting period. Numbers inside columns show the percentage of ears with atelectasis in each group, compared with the total number of ears.

the presence of fluid and/or complications from an untreated MEE. Again, hearing tests were obtained.

Audiometry was done in sound-proof booths by a certified audiologist. The air-bone gap at 500, 1000 and 2000 Hz. was averaged for each visit and analyzed by computer. Also analyzed by computer were the following data: age, chief complaint (during dalay), otomicroscopic findings of fluid and atelectasis, attic retractions, cholesteatoma, perforations and tympanosclerosis. Patients with any of these findings, found present at the beginning of the time period, were not included in the study.

Results

1. The main complaints during the two-and-a-half year time delay were a hearing loss in 96 per cent and earaches in 4 per cent of the children.

2. Middle ear effusion was still found (either persistent or recurrent) in 69 per cent of the ears, but absent in 31 per cent. No significant difference could be found between age and presence of middle ear effusion. Fluid was found in 21 per cent of the ears, with a hearing loss of 20 decibels or less. Above a hearing loss of 25 decibels, there was a statistical correlation present with fluid.

3. Atelectasis or tympanic membrane retraction was found in 20 per cent of the ears. This finding was classified according to Sadé (1979). Very few cases had severe atelectasis (Fig. 1). Atelectasis was more common in children over five years of age ($P = 0.05$). However, no significant differences were found between the hearing loss and the degree of atelectasis.

4. The mean pure tone threshold was 33 decibels at the beginning of the study and 22 decibels at the end of the delay period. In 53 per cent of the ears, an improvement of 10 decibels or more was found; 43 per cent had no change and 3.8 per cent were worse (Fig. 2). No significant differences were found between age and hearing improvement.

Remarkably, the complications of attic retraction, cholesteatoma, perforation and tympanosclerosis were absent.

Discussion

Long-standing MEE may be complicated by atelectasis, attic retraction, drum atrophy or cholesteatoma. These consequences have been reported in treated patients (Brooks, 1980; Renval *et al.*, 1978; Tos and Poulson, 1980; Ben-Ami *et al.*, 1983; Tos, 1981; Muenker, 1980; Haugeto *et al.*, 1979). They were treated with either myringotomy and/or intubation, and in some cases adenoidectomy

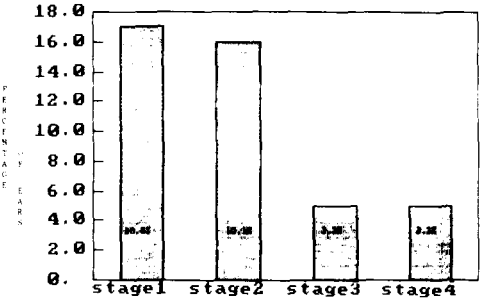


FIG. 2

Change of hearing threshold after waiting period.
X: Change of hearing in db.
Y: Three columns: 1st *IMPR* hearing threshold improvement. The height of each column represents the number of ears with the same improvement in db.; 2nd *No. C* column with ears in which hearing threshold did not change; 3rd *worst* indicates those cases where hearing deteriorated.
Z: Percentage of ears.

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was performed (Brown *et al.*, 1978). The findings presented here need to be related to the ear disease since these patients had not undergone any kind of surgery.

At first sight, the results of this study would support the view that transtympanic tubes are used too early in the course of the disease. Had the waiting period been longer, the chances are that more ears would have been cleared of fluid and less surgery would have had to be performed. In this series, delay in the surgery produced only minor complications.

Normal hearing is important, especially in children involved in educational endeavours. Thus, the placement of transtympanic tubes aids a child and the overall quality of life is improved. On the other hand, hearing may improve to normal levels, despite the persistence of MEE. Pure tone audiometry was found to be inadequate for the diagnosis of MEE (Bluestone *et al.*, 1973; Renval *et al.*, 1978). In our series MEE was detected in 20 per cent of ears, with a hearing threshold of 20 db. or less.

According to Brooks (1980), clearance of MEE increases with age, with peaks of clearing at 5 and 8 years' old. In our series no statistical significance was found between age and hearing improvement.

A final conclusion is not possible from this study. Perhaps a prospective study will give us the necessary data to define the indications for surgical treatment of MEE. The fact that a time delay in surgery apparently causes no serious damage may aid otolaryngologists to perform a prospective study in good conscience. Presently, we follow our patients for the appearance of TM retraction and hearing loss, and always check the child just before surgery for persistence of fluid.

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